

WHAT IS CLAIMED IS:

1. An output apparatus comprising:
a cartridge containing a recording material;
detection means for detecting the remaining amount
5 of the recording material in said cartridge; and
control means for storing the cumulative consumed
amount of the recording material in a non-volatile
memory unit, thereby determining the remaining amount
of the recording material.
- 10/ 2. An output apparatus according to claim 1,
wherein said control means is adapted to obtain said
consumed amount from a cumulative number of used dots.
- 15 3. An output apparatus according to claim 1,
wherein said control means is adapted to obtain said
cumulative consumed amount by estimating the
consumption of the recording material for each of the
entire dots corresponding to the output sheet according
20 to whether said adjacent dot utilizes the recording
material and whether the adjacent dots utilize the
recording material, then thereby estimating the total
consumed amount of the recording material per sheet and
cumulatively adding the consumed amount of the
25 recording material for each page.
4. An output apparatus according to claim 1,

wherein said control means is adapted to obtain said cumulative consumed amount of the recording material, for the characters, by multiplying the information on the average number of dots per font with the number of characters of each font, and, for fonts for which the information on the average number of dots per font is not available and for non-character images, by counting the number of used dots.

10 5. An output apparatus according to claim 3, comprising control means adapted to estimate the exact consumed amount of the recording material by comparing an anticipated consumed amount of the recording material with an actual result where the recording material becomes low in said cartridge, thus storing error information in said non-volatile memory unit, and considering said error information in the subsequent estimation of the consumed amount of the recording material.

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 6. An output apparatus according to claim 3, wherein said control means is provided in advance with the information on the average consumed amount of the recording material per page for each kind of sheet, and is adapted to obtain the cumulative consumed amount by multiplying the kind of sheet with the number of pages.

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7. An output apparatus according to claim 5, wherein the consumed amount of the recording material is estimated from the number of the low states of the recording material in said cartridge.

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8. An output apparatus according to claim 1, wherein said non-volatile memory unit contains information on the number of sheets for which each component of the cartridge is usable, and said control means is adapted to control a warning that each component has been used for such number of sheets.

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9. An output apparatus according to claim 1, wherein warnings of plural kinds are provided for different remaining amounts of the recording material, and said control means is adapted to control the output of said warnings of plural kinds at appropriate timings.

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10. An output apparatus according to claim 1, wherein said control means is adapted to control the output of a warning, for example for the exhaustion of the recording material, at different timings according to the frequency of use of the apparatus.

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11. An output apparatus according to claim 1, wherein said control means is adapted to control the

output of a warning, for example for the exhaustion of the recording material, at different timings according to the consumed amount of the recording material for each page.

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12. An output apparatus according to claim 1, wherein an arbitrary message stored in said non-volatile memory unit is outputted at the exhaustion of the recording material.

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13. An output apparatus according to claim 1, wherein the actual consumed amount of the recording material is stored in said non-volatile memory unit and is transmitted in response to a user operation on the apparatus or a request from a host computer.

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14. An output apparatus according to claim 1, wherein a limit in the period of use of said cartridge is stored in said non-volatile memory unit and said control means is adapted to output a warning when said cartridge reaches said limit of use.

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15. An output apparatus according to claim 1, wherein said control means is adapted to store the information on a date when said cartridge is used for the first time in said non-volatile memory unit and to output a warning when said cartridge reaches the limit

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of use after said date of first use.

16. An output apparatus according to claim 1,
wherein said non-volatile memory unit is provided on
5 said cartridge of the recording material.

17. An output apparatus according to claim 2,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.
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18. An output apparatus according to claim 3,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

19. An output apparatus according to claim 4,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.
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20. An output apparatus according to claim 5,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.
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21. An output apparatus according to claim 6,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.
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22. An output apparatus according to claim 7,

wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

23. An output apparatus according to claim 8,
5 wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

24. An output apparatus according to claim 9,
wherein said non-volatile memory unit is provided on
10 said cartridge of the recording material.

25. An output apparatus according to claim 10,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

15 26. An output apparatus according to claim 11,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

20 27. An output apparatus according to claim 12,
wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

28. An output apparatus according to claim 13,
25 wherein said non-volatile memory unit is provided on
said cartridge of the recording material.

29. An output apparatus according to claim 14, wherein said non-volatile memory unit is provided on said cartridge of the recording material.

5 30. An output apparatus according to claim 15, wherein said non-volatile memory unit is provided on said cartridge of the recording material.

31. A memory medium stored program readable by a
10 computer, comprising steps of:

reading information indicating a remaining amount
of a recording material from a memory;

counting the number of output dots; and

writing information indicating a new remaining
15 amount of the recording material, based on the counted
number of dots, in said memory.

32. A memory medium stored program according to
claim 31, wherein said memory is provided in a
20 cartridge containing said recording material.

33. A memory medium stored program readable by a
computer, comprising:

a step of reading information indicating the
25 service life of a cartridge containing a recording
material from a memory; and

an interface step for informing a host equipment

of a fact that said service life expires, based on said information.

34. A memory medium stored program according to
5 claim 33, wherein said memory is provided in a
cartridge containing said recording material.

35. An output apparatus comprising:
readout means for reading information indicating a
10 remaining amount of a recording material from a memory;
counting means for counting the number of output
dots; and

writing means for writing information indicating a
new remaining amount of the recording material, based
15 on the counted number of dots, in said memory.

36. A memory medium stored program according to
claim 35, wherein said memory is provided in a
cartridge containing said recording material.

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37. An output apparatus comprising:
readout means for reading information indicating
the service life of a cartridge containing a recording
material; and

25 interface means for informing a host equipment of
a fact that said service life expires, based on said
information.

38. A memory medium stored program according to claim 37, wherein said memory is provided in a cartridge containing said recording material.

5 39. An output controlling method comprising:

a step of detecting the remaining amount of a recording material contained in a cartridge;

a step of storing a cumulative consumed amount of said recording material in a non-volatile memory unit;

10 and

a control step of determining the remaining amount of said recording material.

15 40. An output controlling method according to claim 39, wherein said control step is adapted to obtain said consumed amount from a cumulative number of used dots.

20 41. An output controlling method according to claim 39, wherein said control step is adapted to obtain said cumulative consumed amount by estimating the consumption of the recording material for each of the entire dots corresponding to the output sheet according to whether said adjacent dot utilizes the
25 recording material and whether the adjacent dots utilize the recording material, then thereby estimating the total consumed amount of the recording material per

sheet and cumulatively adding the consumed amount of the recording material for each page.

42. An output controlling method according to
5 claim 39, wherein said control step is adapted to
obtain said cumulative consumed amount of the recording
material, for the characters, by multiplying the
information on the average number of dots per font with
the number of characters of each fonts, and, for fonts
10 for which the information on the average number of dots
per font is not available and for non-character images,
by counting the number of used dots.

43. An output controlling method according to
15 claim 41, comprising a control step adapted to estimate
the exact consumed amount of the recording material by
comparing an anticipated consumed amount of the
recording material with an actual result where the
recording material becomes low in said cartridge, thus
20 storing error information in said non-volatile memory
unit, and considering said error information in the
subsequent estimation of the consumed amount of the
recording material.

25 44. An output controlling method according to
claim 41, wherein said control step is provided in
advance with the information on the average consumed

amount of the recording material per page for each kind of sheet, and is adapted to obtain the cumulative consumed amount by multiplying the kind of sheet with the number of pages.

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45. An output controlling method according to claim 43, wherein the consumed amount of the recording material is estimated from the number of the low states of the recording material in said cartridge.

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46. An output controlling method according to claim 39, wherein said non-volatile memory unit contains information on the number of sheets for which each component of the cartridge is usable, and said control step is adapted to control a warning that each component has been used for such number of sheets.

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47. An output controlling method according to claim 39, wherein warnings of plural kinds are provided for different remaining amounts of the recording material, and said control step is adapted to control the output of said warnings of plural kinds at appropriate timings.

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48. An output controlling method according to claim 39, wherein said control step is adapted to control the output of a warning, for example for the

exhaustion of the recording material, at different timings according to the frequency of use of the apparatus.

5 49. An output controlling method according to claim 39, wherein said control step is adapted to control the output of a warning, for example for the exhaustion of the recording material, at different timings according to the consumed amount of the
10 recording material for each page.

 50. An output controlling method according to claim 39, wherein an arbitrary message stored in said non-volatile memory unit is outputted at the exhaustion
15 of the recording material.

 51. An output controlling method according to claim 39, wherein the actual consumed amount of the recording material is stored in said non-volatile
20 memory unit and is transmitted in response to a user operation on the apparatus or a request from a host computer.

 52. An output controlling method according to claim 39, wherein a limit in the period of use of said
25 cartridge is stored in said non-volatile memory unit and said control step is adapted to output a warning

when said cartridge reaches said limit of use.

53. An output controlling method according to
claim 39, wherein said control step is adapted to store
5 the information on a date when said cartridge is used
for the first time in said non-volatile memory unit and
to output a warning when said cartridge reaches the
limit of use after said date of first use.